

A Space-Qualified Single Frequency Fiber Laser for LISA, Phase I

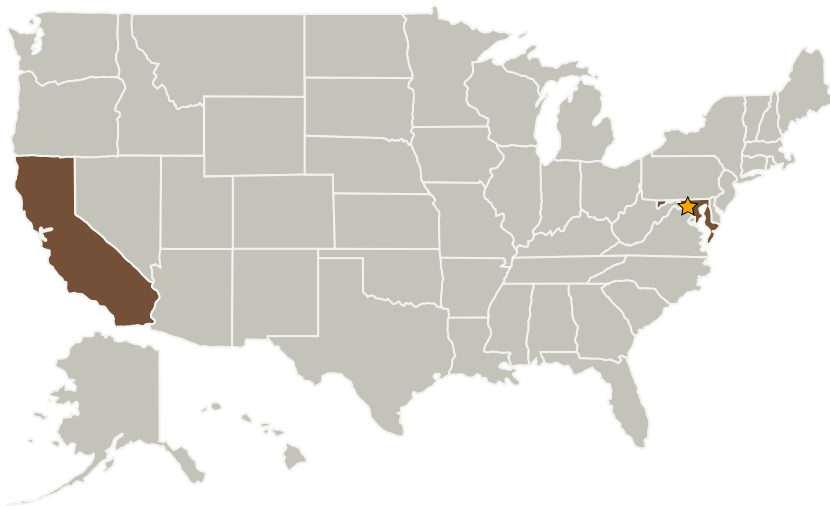
Completed Technology Project (2008 - 2008)



Project Introduction

Single frequency high power lasers have been considered to be an enabling technology for NASA's Laser Interferometer Space Antenna (LISA). PolarOnyx proposes, for the first time, an ultra low noise high power ($> 1\text{W}$, scalable to 10W) single frequency ($< 1\text{ KHz}$) fiber laser source to meet with the requirement of solicitation. It is a specialty fiber based MOPA. The mode selection in seed laser is achieved by using a fiber based ultra narrow bandpass filter. The side mode suppression ratio can thus be suppressed over 80 dB. In the amplifier stage, our unique spectral shaping technology enables us to reduce the SBS and ASE noise significantly by using a commercially available YDF and reuse the residual pump to further increase the efficiency. Radiation hardness will be intensively studied in selection of space qualified fibers and components. A tabletop experiment will be demonstrated in Phase I time frame for proof of concept. A compact prototype will be delivered in Phase II meeting major space qualification such as radiation hardness.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Polaronix, Inc.	Supporting Organization	Industry Small Disadvantaged Business (SDB)	San Jose, California

Primary U.S. Work Locations

California	Maryland
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jian Liu

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.5 Lasers